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EXAMINER

CREPEAU, JONATHAN

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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on March 23 and July 23, 2010 have been entered.

This Office action addresses claims 6, 12, 14, and 16-21. Claims 16, 17, and 20 are allowed. Claims 6, 12, 14, 18, 19, and 21 remain rejected for substantially the reasons of record. This action is non-final.

Claim Rejections - 35 USC § 103

2. Claims 6, 12, 14, 18, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-243951 in view of WO 03/044881 in view of JP 2001-085006.

In the abstract, JP '951 teaches a positive electrode material comprising secondary particles formed from primary particles. The primary particles are connected to each other by sintering. In the abstract, it is disclosed that the material may comprise LiCoO₂. As disclosed in [0025] of the machine translation, up to 40 mol% of the cobalt may be replaced with metals such as nickel and manganese. Regarding claim 14, the recitation of "for an automobile" in the preamble is treated as a statement of intended use and is given little weight (MPEP 2111). Regarding claims 6 and 12, the mean particle size of the primary particles is 0.4-10 microns.

However, JP '951 does not expressly teach that the length in which the plural primary particles are linked on the section of the secondary particle is equivalent to 10-70% of the length of the whole periphery on the section of the plural primary particles, as recited in claim 18, or that the length is 10-70% "through a substantial center of the secondary particle" as recited in claim 14.

However, the reference would motivate the artisan to employ primary particles with relatively large portions of their surfaces touching, thereby rendering the claimed range obvious. As noted above, in the abstract, it is taught that the primary particles are sintered together. Further, in paragraph [0013] of the machine translation, the reference teaches that by sintering, it is possible to raise electric conductivity, to reduce the quantity of a required conducting agent and to raise pack density. The artisan would be motivated by these teachings to manufacture the secondary particles such that relatively large portions of the surfaces of the primary particles are touching each other. Accordingly, the limitations in the independent claims that the length in which the primary particles are linked on the section of the secondary particle is equivalent to 10-70% of the length of the whole periphery on the section of the primary particle would be rendered obvious.

JP '951 further does not expressly teach that the positive electrode material comprises $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{Co}_z\text{O}_2$, as recited in claims 14 and 18.

WO 03/044881 teaches an $\text{Li}_x\text{Mn}_a\text{Ni}_b\text{Co}_c\text{O}_2$ material in the abstract. Example 3 in Table 1 discloses a composition falling within the subscript ranges recited in claims 14 and 18.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the

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$\text{Li}_x\text{Mn}_a\text{Ni}_b\text{Co}_c\text{O}_2$ composition of WO '881 as the active material of JP '951. In the abstract, WO '881 teaches that a positive electrode and a lithium cell using this material have a high energy density and excellent charging/discharging cycle performance. Accordingly, the artisan would be motivated to use the $\text{Li}_x\text{Mn}_a\text{Ni}_b\text{Co}_c\text{O}_2$ composition of WO '881 as the active material of JP '951.

JP '951 further does not expressly teach that the plural primary particles are of a planar type or are composed of planar crystals as also recited in claims 14 and 18.

However, it is submitted that at least a portion of the primary particles of JP '951 would have a "planar" structure, when made by the method of the reference using the composition of WO '881. This would include particles with a generally rectangular cross section, such as tabular or flake-shaped particles. Although JP '951 does not appear to disclose any specific shape of the primary particles (although it explicitly discloses that the secondary particles are spherical or elliptical), such planar primary particles or crystals would be obvious to one skilled in the art for the aforementioned reasons. In addition, to the extent that JP '951 may teach generally round primary particles, it has been held that a change in shape is generally not sufficient to distinguish a claim over a prior art reference absent a new or unexpected result (MPEP 2144.04).

JP '951 further does not expressly teach that the voidage of the secondary particle is 2.5-35%, as recited in claims 14 and 18 or that it is 2.5-10%, as recited in claims 19 and 21.

JP 2001-085006 teaches a positive electrode material comprising a lithium composite oxide in the form of primary particles flocculated into secondary particles (see abstract). The secondary particle has a voidage of 30% or less, preferably 10-20% (see [0029]).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the voidage disclosed by JP '006 in the secondary particle of JP '951. In [0029], JP '006 teaches that the range of 10-20% results in better cycle property. Accordingly, the artisan would be motivated to use the voidage disclosed by JP '006 in the secondary particle of JP '951. Furthermore, in [0013] of JP '951, it is taught that "pack density" may be increased by the sintering, which would be the inverse of the claimed voidage. Accordingly, the voidage may be reduced to a relatively low value, i.e., to the values disclosed by JP '006.

Response to Arguments

3. Applicant's arguments filed March 23 and July 23, 2010 have been fully considered but they are not persuasive insofar as they apply to the present rejection. Applicants assert that unexpected results have been shown in Table 1 of the instant specification, thereby distinguishing claims 14 and 18 over the applied references. However, the showing in the specification is not believed to be commensurate in scope with the claimed invention because Example 1 (which compares favorably to Comparative Example 1) only discloses a ratio of 50-70%, whereas the claimed ratio is 10-70%. The portion of the claimed range between 10-50% has not been accounted for in the showing of unexpected results, and absent such a showing the claims remain rejected over the references of record.

Allowable Subject Matter

4. Claims 16, 17, and 20 are allowed.

5. The following is a statement of reasons for the indication of allowable subject matter:

Independent claim 16 recites, among other features, that the length in which the plurality of primary particles are linked on a section of the secondary particle through a substantial center of the secondary particle is equivalent to 50 to 70% of the length of the whole periphery of the plurality of primary particles on the section of the secondary particle. Applicant's arguments concerning the unexpected results exhibited in Table 1 of the instant specification are persuasive and the subject matter of claim 16 is distinguished over the references applied above.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley, can be reached at (571) 272-1453. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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/Jonathan Crepeau/
Primary Examiner, Art Unit 1795
August 15, 2010